## DETAILED ACTION

1. This action is responsive to amendment dated October 08, 2010.

2. Per Applicants' request, independent claim 6 has been amended, claim 13 is new.

3. Claims 6-13 remain pending.

4. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on October 08, 2010 has been entered.

### Response to Amendment

5. Applicants' amendment filed on 04/21/2005, responding to the 02/04/2005 Office action provided in the Claim objections for claim 6. The examiner has reviewed the amended claim 6 respectfully.

6. The Claim objection is hereby withdrawn in view of Applicants' amended claim 6.

### Response to Arguments

7. Applicant's arguments with respect to claims 6-13 have been considered but the argument are not persuasive. The argument in page 4, second paragraph "the abstract does not, it is respectively submitted, transfer software code. It does teach

manipulating data but not transferring it from a control unit to a fields device. – the argument is not persuasive, See 35 USC § 103 rejections (claims include the amendments) herein below:

**Claim Rejections - 35 USC § 103**

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 6, 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 2002/0077711 A1, by Nixon et al., hereinafter "Nixon"; in view of US 2005/0033886 A1, by Grittke et al., hereinafter "Grittke".

As per claim 6,

**- A method for transferring software code from a control unit to a field device of process automation technology, comprising the steps of:**

Nixon teaches transferring software code from a control unit to a field device, see Nixon's Abstract, "This data and information is manipulated in a coordinated manner by the data collection and **distribution system** and is **redistributed to other applications** where this it is used to perform overall better or more optimal control, maintenance and business activities."; paragraph [0003], "Process control systems, like those used in chemical, petroleum or other processes, typically **include one or more centralized or decentralized process controllers communicatively coupled to at least one host or operator workstation and to**

**one or more process control and instrumentation devices,** such as **field devices**, via analog, digital or combined analog/digital buses." and paragraph [0013], "**applications** may be provided which combine or use data from previously disparate collection systems such as process control monitoring systems, equipment monitoring systems and process performance models to determine a better overall view or state of a process control plant, to better diagnose problems and to take or recommend actions in production planning and maintenance within the plant." – new applications/software code can be distributed/transferred to adapt a better performance results; further in paragraph [0032], "The process control system 14, which may be **a distributed process control system**, includes one or more operator interfaces 14A coupled to one or more **distributed** controllers 14B via a bus, such as an Ethernet bus." -- wherein the distribution system is used for 'transferring' control software and data.

**- integrating the software code in a software module, which represents the software driver of the field device and which encapsulates data and functions of the field device and requires, as runtime environment, an operating program for field devices;**

See Nixon's paragraph [0007], "it is currently known to provide an expert engine that **uses process control variables** and limited information about the operating condition of the **control routines or function blocks or modules associated with process control routines** (integrating the software code in a software module) to detect poorly operating loops and to provide information to an operator about suggested courses of action to correct the problem."; further see FIG. 4 and description in paragraph [0086], "A process control **runtime system** 318 is in contact with the web services 310 and the external servers 316. The **runtime**

**system** 318 includes control applications, operator interface applications, alarms and events applications and **real-time data applications** any of which can use the data from the external servers or from the web services" -- runtime environment. Also see paragraph [0092], "Each area may be broken down into different units such as Unit1, Unit2, etc. Still further, each unit then can have **numerous modules associated therewith**. These modules may be any modules, such as **modules developed within the process control network in the consistent format or modules associated with disparate data sources** (module encapsulate data and functions). These **modules are generally used to configure how different applications** operate in conjunction with each other and **communicate** with each other." -- transfer of the software code to various field device via communication connections.

Nixon teaches transmitting software module to field devices, but he does not mention device driver explicitly, however, Grittke teaches it in an analogous prior art; see Grittke's FIG. 2 and description in paragraph [0028], "The WAN-, LAN-interface 13 cares, **using the appropriate driver program** (Bus-Client), **for converting the data to the TCP/IP standard,** and uses a stored address book for selecting the appropriate Internet address of the field bus adapter 7. The data are exchanged between the computer unit/access unit 8 and the field bus adapter 7 over the WAN, LAN."

It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to supplement Nixon's disclosure of transferring software code from a control unit to a field device by using device driver taught by Grittke. The modification would be obvious because one of ordinary skill in the art would

be motivated to convert the protocol to the appropriate field bus standard (see Grittke's paragraph [0028]).

**- establishing a communication connection with the operating program and the field device, resulting in a transfer of the software code via the communication connection to the field device; and**

See Nixon's paragraph [0005], "many process plants, and especially those which use **smart field devices**, include equipment monitoring applications which are used to help **monitor and maintain the devices** within the plant regardless of whether these devices are process control and instrumentation devices or are other types of devices. For example, the Asset Management Solutions (AMS) application sold by Fisher-Rosemount Systems, Inc. **enables communication with and stores data pertaining to field devices** to ascertain and track the operating state of **the field devices**." -- establishing a communication connection with the operating program and the field device.

**- executing the software code with the field device by using a function-block shell representing an application program interface between the ~~field bus~~ fieldbus stack and the function-block applications.**

See Nixon's paragraph [0103], "a shadow function block or shadow module element is **a function block or module in the configuration database of the integrated system and is configured to be useable as a module.** This shadow module, however, is in contact with the data source or device and has its outputs generated by or provided by that external device. Furthermore, the shadow module provides the inputs it receives to the external data source. Thus, the shadow module merely has inputs and outputs and a state that reflects the inputs to, outputs of and the state of the actual device or data source as determined by the data

received from that data source. The use of a shadow module, however, **makes the inputs and outputs of the external device or data source accessible to the other modules within the integrated system** (the shadow function block is executed functioning as an interface between the fieldbus and the function-block application), such as modules associated with applications in the asset utilization suite 50. In this manner, the shadow function block or module operates as a conduit of information between the external data source and the applications within the integrated system by putting the data received from the external data source in a format that is usable by other applications within the integrated system." -- using a function-block shell representing an application program interface between the fieldbus stack and the function-block applications.

As per claim 8,

- **The method as claimed in claim 6, wherein: the software code corresponds to a function block.**

The rejection of claim 6 is incorporated; further see Nixon's paragraph [0007], "it is currently known to provide an expert engine that uses process control variables and limited information about the operating condition of **the control routines or function blocks or modules associated with process control routines**" and paragraph [0059], "different process controller or control applications 208 illustrated in FIG. 3 as part of the **process control function block** 206 may use the collected process control data 201 for a number of reasons or purposes." – software code corresponds to a function block.

As per claim 9,

- **The method as claimed in claim 8, wherein: said function block is provided in the form of a function block according to Foundation® Fieldbus Specifications.**

The rejection of claim 8 is incorporated. The 'Foundation® Fieldbus Specifications' is not novel to the people in the art, see paragraph [0007] under BACKGROUND OF THE INVENTION of the current application, "**Foundation Fieldbus Specifications, which are publicly available**"; further see Nixon's paragraph [0103], "In the preferred embodiment of the configuration system, the modules created for the devices, applications, etc. within the integrated system and the external data sources are based on the **Fieldbus** or DeltaV module concept, which are very similar. Here, the module 364, because it is associated with an external data source which does not use the module organization, is a shadow function block or shadow module. Generally speaking, **a shadow function block or shadow module element is a function block or module** in the configuration database of the integrated system and is configured to be useable as a module."

As per claim 10,

- **The method as claimed in claim 8, wherein: said function block includes e.g. algorithms, parameters or methods of the field device.**

The rejection of claim 8 is incorporated; further see Nixon's paragraph [0003], "Process control systems, like those used in chemical, petroleum or other processes, typically include one or more centralized or decentralized process controllers communicatively coupled to at least one host or operator workstation and to one or more process control and instrumentation devices, such as **field**

**devices,** via analog, digital or combined analog/digital buses. **Field devices**, which may be, for example valves, valve positioners, switches, transmitters, and sensors (e.g., temperature, pressure and flow rate sensors), perform functions within the process such as opening or closing valves and measuring **process parameters**."

As per claim 11,

- **The method as claimed in claim 6, wherein:**

**the authenticity of said software module is checked by the function-block shell.**

The rejection of claim 6 is incorporated; Nixon teaches transmitting software module to field devices, but he does not mention checking the authenticity explicitly, however, Grittke teaches it in an analogous prior art; see Grittke's paragraph [0033], "Following the actuation of the switch 14, access to the field devices 2, 3, 4, or the field bus adapter 7, is possible for a certain time span. This safety level already offers a certain amount of protection against unauthorized accessing of the devices 2, 3, 4, 7. For instance, it is not out of the question that a plurality of accessings of the device might occur following actuation of the switch 14, and that perhaps one of them might be unauthorized. Therefore, in order to block unauthorized accessing, only the first accessing, or only one connection, is allowed after the actuation of the switch, while all additional accessing/connection attempts are rejected. This assumes that the first accessing following the switch actuation is **authorized**. However, should the first accessing be unauthorized, then this is noticed by the **authorized** accessor, since he is subsequently rejected. In this case, the authorized accessor can immediately institute countermeasures."

It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to supplement Nixon's disclosure of transferring software code from a control unit to a field device by checking authenticity taught by Grittke. The modification would be obvious because one of ordinary skill in the art would be motivated to ensure the field device has the appropriate safety level (see Grittke's paragraph [0033]).

As per claim 12,

- **The method as claimed in claim 6, wherein:**
**the parameters of the function-block shell which is composed of a function-block user interface and the function-block software code are changed via the function-block user interface.**

The rejection of claim 6 is incorporated; further see Nixon's paragraph [0005], "In some instances, the AMS application may be used to communicate with devices to **change parameters within the device,** to cause the device to run applications on itself, such as self calibration routines or self diagnostic routines, to obtain information about the status or health of the device, etc."

10. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable r US 2002/0077711 A1, by Nixon et al., hereinafter "Nixon"; in view of US 2005/0033886 A1, by Grittke et al., hereinafter "Grittke"; further in view of US Patent No. 5,909,368, by Nixon et al., hereinafter "Nixon368".

As per claim 13(new),

**- A method for transferring software code from a control unit to a field device of process automation technology, comprising the steps of:**

**integrating the software code in software module, which represents the software driver of the field device and which encapsulates data and functions of the field device and requires, as runtime environment, and operating program for field devices;**

**establishing a communication connection with the operating program and the field device, resulting in a transfer of the software code via the communication connection to the field device, wherein the software code corresponds to a function block; and**

For the integrating, establishing features see claim 1 rejection.

**utilizing a security mechanism to prevent a virus attack on the field device during transmission of the function block into a field device.**

See Nixon368, column 13, lines 10-23, "The Explorer™ 310 is operated by a user to select, construct and operate a configuration. In addition, the Explorer™ 310 supplies an initial state for navigating **across various tools and processors in a network.** A user controls the Explorer™ 310 to access libraries, areas, process control equipment and **security operations**. FIG. 3 illustrates the relationship between various tools that may be accessed by a task operating within the process control environment 100 and the relationship between components of the process control environment 100 such as libraries, areas, process control equipment and **security**."

Nixon368 is the same inventor as Nixon, it would have been obvious to a person of ordinary skill in the art at the time of the invention was made to supplement Nixon368 to Nixon to add the security checking for the field device.

11. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable US 2002/0077711, by Nixon et al., hereinafter "Nixon"; in view of US 2005/0033886, by Grittke et al., hereinafter "Grittke"; further in view of U.S. 2005/0046838 by Wittmer et al., hereinafter "Wittmer".

As per claim 7,

**- The method as claimed in claim 6, wherein: the software module is provided in the form of a DTM (device type manager) according to FDT-Specifications, and the operating program serves as an FDT-frame application.**

The rejection of claim 6 is incorporated; Nixon and Grittke teach transmitting software module to field devices, but he does not mention device type manager and Field Device Tool Specifications explicitly, however, Sharpe teaches it in an analogous prior art; see Sharpe's column 1, lines 13-15, "The present invention relates generally to **management systems having applications that manage "smart" field devices** within a process or a plant and, more particularly, to a communication network capable of communicating with one or more smart field devices within a process." – Device Type manager for field devices. Also see column 1, lines 39-43, "Typical smart field devices are capable of transmitting an analog signal indicative of the value associated with the device, for example, a measurement value, and of storing and also digitally **transmitting detailed device-specific information** (FDT-Specifications), including calibration, configuration,

diagnostic, maintenance and/or process information. Some smart devices may, for example, store and transmit the units in which the device is measuring, the maximum ranges of the device, whether the device is operating correctly, troubleshooting information about the device, how and when to calibrate the device, etc." And further see column 6, lines 10-13, "the FMS system 10 is **a PC-based software tool** that includes applications which **perform field-device management tasks.** (FDT-Specifications). The FMS system 10 integrates device management for each of the devices within the process" – Also see an FDT-frame application in Fig. 1.

It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to supplement Nixon's and Grittke's disclosure of transferring software code from a control unit to a field device by using device type manager and field device tool specific applications taught by Sharpe. The modification would be obvious because one of ordinary skill in the art would be motivated to perform field-device management tasks and integrate device management for each of the devices (Sharpe's column 6, lines 11-12).

## Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

**Barthel** et al., US Patent No. 7,337,369, discloses a microprocessor-controlled standard field device, such as a measuring sensor or an actuator, is connected to a field bus system that, in turn, is connected to, for example, a freely programmable controller. The field device is equipped with a security layer for

carrying out a security proven communication. A secure and simultaneously cost-effective communication with a control device via a field bus system is made possible by implementing a security layer in, e.g., a conventional operationally proven or redundant standard field device.

**Havekost** et al., US Patent No. 6,774,786 B1, discloses the function blocks or field devices in which these function blocks are implemented are configured to detect errors, faults or problems that occur within the process control loops or the functions being performed therein and to send a signal, such as an alarm message, to notify an operator at an operator workstation or other user interface that an undesirable condition exists within the process control system or within a control loop of the process control system. Such alarms may indicate, for example, that a function block is not communicating, has received or generated an out of range input or output, is undergoing a fault or other undesirable condition, etc.

**Masui** et al., US Patent No. 6,924,663 B2, discloses a programmable logic device with ferroelectric configuration memories storing multiple configuration data sets. The device has programmable logic blocks, interconnections, and I/O blocks to provide desired logic functions. Those building blocks can be dynamically reconfigured by changing the selection of configuration data stored in the device's integral configuration memories. The configuration memories are divided into groups, so that they can be loaded concurrently with multiple configuration data streams. To protect the content of configuration memories from unauthorized access, the device employs an authentication mechanism that uses security IDs stored in the configuration memories. The device has a memory controller to provide an appropriate power supply sequence for ferroelectric

memory cells to ensure the reliable data retention when the device is powered up or shut down.

**Ishibashi**, US Patent No. 6,782,476 B1, discloses a CPU module, satellite or digital TV tuner, MPEG2 decoder, and DVD-RAM drives have authenticators for making device authentication, key exchange, and the like. These authenticators hold authentication data (authentication formats) of the corresponding function modules. By exchanging the authentication formats between devices which are to authenticate each other, authentication can be done in units of function modules.

**Stevenson** et al., US Patent No. 6,738,388, discloses a process controller that is communicatively coupled to an external field device via a communication network uses a shadow function block disposed within a process controller to enable implementation of a control routine that uses both an internal function block disposed within the process controller and an external function block disposed within the external field device. The shadow function block includes a communication port that communicates with the external function block via the communication network to thereby receive data pertaining to the external function block, a memory that stores the received data according to a configuration protocol of the internal function block and an output that provides the stored external function block data to the internal function block according to the configuration protocol of the internal function block.

**Herzog** et al., US 2005/0177533 A1, discloses a method for maintaining a production installation having a plurality of field devices F1, F2, F3 connected partly, or completely, over a data bus D with a control system L, the field devices F1, F2, F3 are registered in a manufacturer data base HG-DB with a manufacturer-specific identification and manufacturer-specific information relevant for

maintenance, and in a customer database IB-DB with a customer-specific identification and customer-specific information. An electronic database query on the basis of maintenance criteria is performed in both of the databases HG-DB and IB-DB. In this way, both manufacturer information and customer information can be considered in the maintenance process.

**Hessmer** et al., US 2002/0112044 A1, discloses a new way to monitor data access servers and the field equipment with which the data access servers are associated, and with whom the data access servers communicate to render data concerning the present state of a manufacturing and process control network. More particularly, the Hessmer's invention comprises a manufacturing process utility (and methods performed thereby) that facilitates performance of diagnostic analysis of a remote data access server and its associated process control system information sources. The manufacturing process utility includes a server agent that initially facilitates discovery of a remote data access server to enable the creation of a communication interface with the remote data access server and to thereafter receive diagnostic data from the remote data access server.

13. The following summarizes the status of the claims:

35 USC § 103 rejection: Claims 6-13

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chih-Ching Chow whose telephone number is 571-272-3693. The examiner can normally be reached on 8:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wei Zhen can be reached on 571-272-3708. The fax phone number for the organization where this application or proceeding is assigned is

571-273-8300. Any inquiry of a general nature of relating to the status of this application should be directed to the **TC2100 Group receptionist: 571-272-2100**.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Chih-Ching Chow/
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